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The Impact of Human Resources' Practices, Employees' Digital Skills and Leadership on Digital Maturity

A study of the portuguese banking industry

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Abstract

Digital Transformation is the new buzzword. To assess the sucess of a company's Digital Transformation and its readiness to continue transforming, Digital Maturity Models have been developed. However, human-related variables are not often considered in those models. Focusing on the banking industry, these study examines the impact of Human Resources' Practices, Employees' Digital Skills and Leadership on Dgital Maturity. Through the collection of primary data through surveys and its analysis through regression models, results suggest that these variables have a positive impact in Digital Maturity, through direct and/or indirect effects.

Keywords: Digital Maturity, HR Practices, Digital Skills, Leadership

1. Introduction

The world we live in is increasingly uncertain. To stay competitive, companies need to be agile and constantly ready to adapt. Technologies have been essential to deal with this, with firms relying more and more on them to boost their agility (Sambamurthy et al. 2003). As an answer, Digital Transformation – the process of using digital technologies to increase a firm's efficiency and competitive advantage – has become the buzzword. Around the world, managers expect it to play a major role for their companies and believe it will be the next Industrial Revolution, both in terms of size and impact. However, a study conducted by Capgemni Consulting and MIT Sloan Management Review showed that 63% of executives and managers consider the pace of technological change in their companies to be too slow. (Xu 2014) Digital transformation is cross sectorial, happening in almost all industries. However, throughout different strategies and efforts, companies achieve different results. To better understand why, Digital Maturity Models have been developed by academics and practitioners. These aim at understanding a company's level and readiness for Digital Transformation by assessing several internal dimensions that might affect it. (Becker et al. 2009). One of such dimensions regards people and culture. Still, the influence of a firm's human capital in its digital maturity remains a largely unexplored topic, with literature focusing more on the technological side of the process (Hartl et al. 2017).

The banking industry arises as a particularly interesting one when studying the importance of human capital on digital maturity, for three main reasons. First, similarly to what happens on other service industries, personal relationships are generally crucial, and value is mostly created by people (employees). Second, in the last few years, banks have been substantially increasing their investment in digital technologies and programs, recognizing the potential it can have. (Cuesta et al. 2015). Third, despite all the financial efforts, banking is an historically conservative industry, characterized by risk aversion and resistance to change (Yanagawa 2018). Such characteristics do not contribute positively to Digital

Transformations. Thus, focusing on the Banking Industry, the main purpose of this study is to understand how human factors affect Digital Maturity.

The rest of the study is organized as follows: in chapter two, the topics of Digital Transformation, Digital Maturity and the Banking Industry are analysed through the revision of existing literature. In chapter three, the research questions, hypothesis and conceptual model are developed. Next, the applied methodology, with the main methods and procedures, are explained. In chapter five data analysis is presented, followed by a further discussion of results and implications in chapter six. Finally, in chapter seven, limitations, recommendations for further research and main conclusions are summed up.

2. Literature Review

2.1 Digital Transformation

Finding its roots in the 1990s, Digital Transformation is not a new matter. (Muzyka et al. 1995) However, its meaning has been evolving over the years. According to Salesforce (2018), this evolution is explained by three main concepts: Digitization, Digitalization and Digital Transformation. Digitization was (and is) a process clearly focused on moving analog business records to a digital format (Keuper et al. 2013). Later on, with the amount of data captured increasing both in volume and in importance, companies started to use it alongside with the digitized information to increase their efficiency. This last practice is called Digitalization (Salesforce 2018). Digital transformation, however, is a much more holistic concept. It refers to the process of using digital technologies to reimagine businesses, either by creating completely new ones or by modifying those that already exist (Salesforce 2018). Digital transformation comes as an answer to the recent technological disruptions that have been rapidly changing environments and competitive dynamics, forcing companies to constantly reinvent themselves (Downes and Nunes 2013). In sum, the evolution of the concept regards not only time but also impact, with Digital Transformation as we know it being considered more impactful and complex than ever (Ismail et al. 2017).

However, and opposite to what is commonly thought, Digital Transformation is not only, nor mostly, about technology (Hinings et al. 2018). Despite being undoubtedly supported by IT-related matters, Digital Transformation takes them to a more strategic level (Peppard 2018). Thus, it requires major transformations in the company as a whole: in business models, processes, organizational structures, strategy (Westerman et al. 2011) and also culture, since Digital Transformation highly impacts – and is impacted - by a company's norms and values (Liu et al. 2011). For this reason, several researchers consider that it should become an integral part of a firm's corporate strategy (e.g., Bharadwaj et al. 2013, Ismail et al. 2017), since it is not only the CIO's or IT department's business anymore: it is everybody's business. (Sousa and Rocha 2019).

Nonetheless, defining an optimal digital transformation strategy is extremely complex for the same reason it is crucial: it affects all areas of a company. Besides, there is no one-size-fits-all approach: the sucess of a digital transformation process is highly dependent on the specific path taken by each organization. (Ismail et al. 2017) To help on this, a new concept has been emerging: Digital Maturity.

2.2 Digital Maturity

In a simplistic way, a company's Digital Maturity describes the status of its Digital Transformation (Chanias and Hess 2016). In other words, the term aims to reflect not only the Digital Transformation that has already been done by the firm, but also its readiness to continue transforming (Teichert 2019). As expected, similar to Digital Transformation, Digital Maturity involves not only technology but also changes in products/services, processes and culture (Chanias and Hess 2016). Due to this, companies can only achieve high levels of digital maturity if they have, on one hand, the right digital foundations and, on the other hand, the knowledge on how to leverage those foundations to create a competitive advantage (Shahiduzzaman et al. 2017).

Achieving high levels of Digital Maturity is on every company's best interest, as evidence suggests that the ones that do can actually outperform competitors *(*Westerman et al. 2012*).* Digital Maturity models have been developed to help companies assessing their Digital Maturity levels. In fact, understanding where they are is crucial to design a path towards where they want to be in the future in terms of digital goals (Pöppelbuß and Röglinger 2011). Thus, these models are essential to provide organizations a vision of their status-quo (Becker et al., 2009), allowing them to get an unbiased assessment of their main bottlenecks in a multiple set of pre-defined dimensions. These dimensions are firm-specific areas/components/levers that reflect fundamental aspects of a company's digital transformation, such as IT Capabilities or Culture (Berghaus and Back 2016). However, there is not a consensus in literature about which dimensions should be used to assess a firm's Digital Maturity, as different models follow different approaches (Teichert 2019). Besides, there is evidence that the majority of models that have been developed provide an incomplete overview of Digital Maturity (Teichert 2019).

One of the most known Digital Maturity Models was created by the South Australian Government and measures five different organizational dimensions: Governance & Leadership, People & Culture, Capacity & Capability, Innovation and Technology. Through several questions, the tool assesses the maturity level rating of each dimension and then averages their scores to get an overal Digital Maturity Rating. Similarly, Forrester (2016) also developed a hands-on Maturity Model that measures four different dimensions: Culture, Organization, Technology and Insights. Academia has some models to be explored as well, as the Digital Maturity Model by Berghaus and Back (2016). When compared to the abovementioned two, this is a more segmented model that dives into nine dimensions: Customer Experience, Product Innovation, Strategy, Organization, Process Digitization, Collaboration, Information Technology, Culture & Expertise and Transformation Management.

All in all, the importance of the topic is supported by the increase of academic research in the field since 2016. However, this increase was mainly driven by Industry 4.0., with a higher focus on the secondary sector rather than the tertiary (Teichert 2019). In fact, this can be considered a relevant research gap, as most of the research looks at manufacturing and ignores other industries and their challenges (Teichert 2019). In this context, the service industry arises as particularly significant due to the countless opportunities that digital technologies can bring to it. (Baines et al. 2009)

2.3. A Human Side in Digital Maturity?

Typically, a digital mature organization has its culture described as collaborative and innovative, where employees are encouraged to embrace risk and rapid experimentation (Kane et al. 2015.) Attributes like agility, flexibility, real-time feedback and customer centricity also tend to be found on the digital culture spectrum (Buvat et al. 2017). Furthermore, research suggests that a culture of adaptability and involvement are essential for the development of high levels of innovation and creativity inside a company (Denison and Mishra 1995). Although all these points slightly touch the "soft" side of a successful Digital Transformation, particularly through culture, none of them encompasses directly the human role in a company's Digital Maturity.

Starting directly with employees, the majority of organizations still see their human resources as an obstacle to digital transformation, rather than a driving force (Vuksanović et al. 2020). In fact, the ability of sucessfully leveraging the business potential of technology depends on the capabilities that the company has in-house. These capabilities are highly determined by **Employees' Digital Skills** (Hoberg et al. 2020). However, the current labour market presents a critical shortage of digital skilled workers. (Sivaraman 2020). This is reflected on the majority of companies still stating that there is a digital skills' gap within the organization, as the skills available internally do not match the digital ones that are needed. (Hoberg et al. 2020). To mitigate this gap, **Human Resources (HR) Practices** – mainly reflecting

selection/recruiting practices as well as training and development activities – become crucial. In fact, these can be seen as the main driver for a digital skilled workforce (Chyhrym et al. 2019). Not surprisingly, digitally mature organizations are typically described as investing heavily on talent, both trough recruiting and training – all in all, investing in their employees' skills and development (Kiron et al. 2016). Along with HR Practices, there is also literature suggesting that **Leadership** may influence the success of a company's Digital Transformation. Particularly, leaders are crucial to soften the inevitable changes that come with Digital Transformation, as well as to motivate and support employees' along the process (Sow and Aborbie 2018). As such, leaders themselves need to be able to embrace digital change and adapt to new realities (Vey et al. 2017). It is not surprising, then, that, in digital mature companies, leaders usually excel in soft skills (Kiron et al. 2016).

The overall importance of human capital has been extensively studied, with evidence highlighting its direct effect on economic development (Squicciarini and Voigtländer 2015) and organizational performance (Eesley and Roberts 2012). Research also points towards human capital being determinant towards technology adoption and innovation (Caselli and Coleman 2006, Ciccone and Papaioannou 2009). Specifically diving into Digital Transformation, Berghaus and Back (2016) go one step further and argue that digital change is primarily a result of human resources affinity and commitment to the Digital Transformation itself. However, there is a lack of literature diving directly into the importance of the human side in a company's digital maturity, with the majority of papers and articles not giving it the attention it deserves. (Hartl et al. 2017).

2.4. The Banking Industry

When studying the connection between Digital Maturity and human-related factors, the banking industry comes as a particularly relevant one for several reasons. Firstly, since banks typically focus on the delivery of services, they are considered labor-intensive organizations. For this reason, the efficiency of human

resources practices and the employees' organizational commitment is very important for their performance. (Paşaoğlu 2015) Yet, as stated, and despite apparently counterintuitive, the majority of research in the field focuses on the secondary sector (the so-called Industry 4.0) rather than on the tertiary (Teichert 2019). Studying the banking industry comes as a first step to help closing this literature gap.

Secondly, because of the cultural specificities of the banking industry. Historically, the industry is known for having a dominant hierarchical culture, for being very strict and rule oriented. (Belias et al. 2015) This may somehow conflict with the type of culture that should be privileged in a digital environment, where flexibility, agility and risk taking are encouraged. (Kane et al. 2015).

Thirdly, because of the "digital run" that has been happening in most banks around the world. As in most industries, digital transforming the traditional banking systems has the potential to not only increase its revenues, by creating new offers and reaching new customers, but also to reduce its risks and costs. However, Digital Transformation in the banking industry is particularly urgent (Cuesta et al. 2015) for two main factors. The first one is related with a change in consumer habits. In fact, consumers are increasingly demanding in what comes to digital solutions, especially mobile-wise, mainly due to a higher convenience (Shankar et al. 2020) The second one regards new entrants in the market. There are new competitors in the banking industry that have the potential to threat the status-quo. The most notorious ones are called Fintechs that, due to lower regulatory burdens and simpler cost structures, have been exploiting technology to offer more flexible and customized services (Navaretti 2018). The limitations brought by industry regulations, added to giant structures and a rigid corporate culture, have been preventing banks from directly competing with these new entrants under similar conditions. This brings light on why banks all over the world have been worried about their Digital Transformation and, consequently, heavily investing in Information and Communication Technologies (ICT). These efforts have started to show some results, namely with an increase in the number of services available through

new channels, as well as transformations in the branch itself. (Cuesta et al. 2015). However, it is not yet clear if the investment on human resources has been enough to fully unlock the potential of this technology.

3. Research Question, Hypothesis and Conceptual model

3.1. Research Question

This study aims to build on the existing body of knowledge regarding Digital Maturity, through the evaluation of some of the dimensions that were not considered sufficiently relevant until this point to be included in the assessment. The existent Digital Maturity models focus their attention on dimensions like IT Capabilities, Process Digitization or Strategy. More recently, Culture has also started to be included, touching on some important topics regarding a company's soft capabilities. However, human factors are typically overlooked when assessing a firm's Digital Maturity or when building models with that purpose. The firms' Human Resources - and the way they are managed – are, in general, not directly considered. Yet, there is evidence suggesting that there is a human side in Digital Transformation. Particularly, and building on the previous literature review, there are three variables that are often suggested to impact the success of a Digital Transformation process: Human Resources (HR) Practices, Employees' Digital Skills and Leadership. This becomes even more relevant in companies that highly depend on human relationships, like banks. Still, they are not often considered when assessing Digital Maturity. Thus, the purpose of this study is to **understand whether HR Practices, Employees' Digital Skills and Leadership have an impact on a bank's Digital Maturity.**

3.2. Hypothesis

The degree of a company's Digital Maturity highly depends on its capacity to manage change (Irimiás and Mitev 2020). Research points towards employees – and people in general – being, by nature, resistant

to change. (Ford et al. 2008). However, evidence shows that the right **HR Practices** can play a crucial role in mitigating this resistance (Neves et al. 2018), mainly through employees' training and development (Kiron et al. 2016). Moreover, **Leadership** in general - and immediate supervisors in particular - can be crucial to a smooth implementation of change, since they work as the main point of contact between the organization and the employee (Lewin 1943). Therefore, HR Practices and Leadership are expected to positively influence Digital Maturity. Additionally, the full benefits of technology usage cannot be enjoyed if employees do not have the **Digital Skills** needed to do take advantage of them. (Majovski et al. 2017). Building on this, there is evidence suggesting that there is a relationship between the proportion of digitally skilled employees and the emergence of digital innovation in a company. (Shakina et al. 2020) Thus, it is also expected that Employees' Digital Skills have a positive effect on Digital Maturity. Following these three rationales, the first set of hypotheses is created.

Hypothesis 1.1.: HR Practices positively affect Digital Maturity.
Hypothesis 1.2.: Employees' Digital Skills positively affect Digital Maturity.
Hypothesis 1.3.: Leadership positively affects Digital Maturity.

However, HR Practices, Employees' Digital Skills and Leadership are not clearly independent from each other, quite the opposite. In fact, literature shows that HR Practices are crucial to employees' development and, consequently, their Digital Skills (Martín 2013). In parallel, there is also evidence that HR Practices can influence Leadership, particularly through the design and deployment of HR Programs that enable leaders' development and alignment with organizational goals. (Maheshwary and Yadav 2019). Therefore, the second set of hypotheses is created:

Hypothesis 2.1.: HR Practices positively affect Employees' Digital Skills.
Hypothesis 2.2.: HR Practices positively affect Leadership.

To finish, if all the other hypotheses are supported (meaning, if there is evidence that HR Practices, Employees' Digital Skills and Leadership positively affect Digital Maturity, while HR Practices also affect Digital Skills and Leadership), it becomes interesting to understand, then, if there are **indirect effects** to be considered in the results previously found. In other words, if a relationship is found between HR Practices and the other two explanatory variables, it is to expect that HR Practices indirectly affect Digital Maturity, through Employees' Digital Skills and Leadership. Thus, the third hypothesis is developed:

Hypothesis 3.1: HR Practices have a positive indirect effect on Digital Maturity.

3.3. Conceptual Model

When aggregated, the above-mentioned hypotheses result in the conceptual model behind this work project. A visual representation of the conceptual model and its relationships can be found in Figure 1 below. All in all, three variables are expected to positive influence a bank's Digital Maturity: HR Practices (a), Employees' Digital Skills (b) and Leadership (c). However, and going a bit deeper, these three explanatory variables are not expected to behave independently. Particularly, HR Practices is expected to positively influence Employees' Digital Skills (d) and Leadership (e). Moreover, if all these relationships are confirmed, a proportion of HR Practice's influence on Digital Maturity (a) is expected to be indirect (f), through the mediation of Employees' Digital Skills and Leadership.

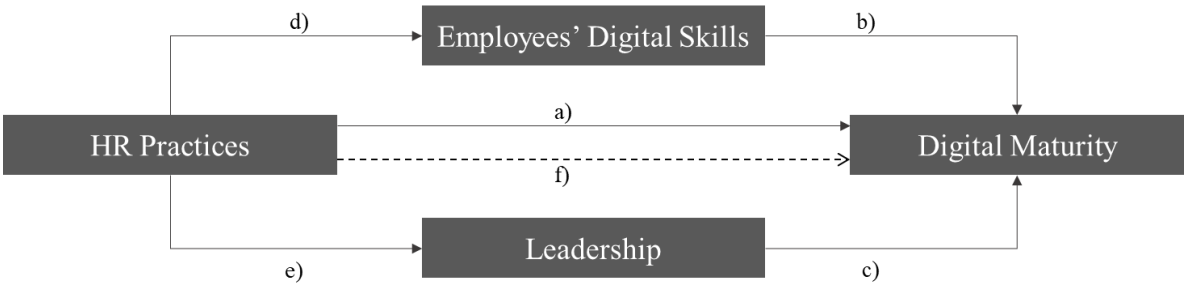

Figure 1: Conceptual Model

4. Methodology

4.1. Digital Maturity Assessment

Before proceeding, it is important to explain the philosophy behind the way Digital Maturity was assessed to the purpose of this study. A company's Digital Maturity is a reflection of how that company performs in a predetermined set of dimensions. Thus, to measure Digital Maturity (the dependent variable of this thesis' conceptual model), a set of dimensions has to be evaluated and averaged. However, choosing the dimensions that will be part of the Digital Maturity variable is not as objective as it should be, since there is not a consensus in literature (nor in practice) regarding which dimensions should be used and how they should be framed. Thus, two paths could be followed. The first and most direct option was to choose one of the Digital Maturity Models that were already developed, either in literature or practice. The second option – more risky -, was to build and adapt from different models, in order to choose a set of dimensions that were specifically relevant for this study. After a lot of research and ponderation, the second option was chosen. The nature of this study makes it crucial to consider the specificities of the banking industry, and, as stated, the majority of models is made specifically to evaluate the Manufacturing Industry (Industry 4.0). Thus, for the purpose of this study, a specific set of dimensions was considered, according to the following criteria: 1) the dimensions chosen should already have supporting evidence regarding their direct effect towards a company's Digital Maturity, and 2) they should be considered somehow relevant for the banking industry. As expected, this approach brings some subjectivity towards the topic. However, it was the best way that was found to account for industry specificities.

All in all, 7 variables were chosen to form the Digital Maturity variable: **Culture** (Schuhmacher et al. 2016, Berghaus and Back 2016, KPMG 2016, Leino et al. 2017), **Organizational Structure** (Schuh et al. 2017), **IT Capabilities** (Valdez-de-Leon 2016, Bharadwaj et al. 2013, McLaughlin 2017), **Customer**

Centricity (Valdez-de-Leon 2016), **Product Innovation** (Lichtblau et al. 2015), **Process Digitization** (Friedrich et al. 2011) and **Strategy & Vision** (Valdez-de-Leon 2016, Schuhmacher et al. 2016).

4.2. Participants and procedures

In order to test the hypotheses and the overall framework, quantitative data was gathered using the survey method. The survey was built using Google Forms and distributed in two main ways: firstly, through the author's private network. Secondly, through LinkedIn, directly (but randomly) approaching individuals that make part of this study's population of interest. Due to the purpose of the study, only banking employees in Portugal were asked to fill in the survey.

The survey was composed by 44 questions, from which 10 regard respondents' characteristics (mainly demographics) and 34 aim to evaluate the variables that form the conceptual model. These last questions were measured on a Six-Point Likert Scale, to avoid neutral positions and midpoint subjectivity. (Chyung et al. 2017) It is important to stress that the questions were formulated so that they could incorporate the employees' perception of the truth, opposite to what typically happens in Digital Maturity Assessments (where questions are answered by executive members or external consultants). This was considered particularly crucial to evaluate HR Practices, since only analysing management's perspective is not enough to get an unbiased version of employees' real experiences. (Alfes et al. 2013). After a period of 2 weeks, 180 answers were collected. No incompletion problems were found, leaving the final sample with a size of N = 180.

4.3. Measures and Reliability Analysis

In total, the survey's 34 questions resulted in 10 constructs. Seven of them define the status-quo of dimensions considered to assess a company's Digital Maturity, namely: Culture, Organizational Structure, IT Capabilities, Customer Centricity, Product Innovation, Process Digitization and Strategy &

Vision. The other three are the ones whose relevance for the matter is being evaluated, namely: HR Practices, Employees' Digital Skills and Leadership. A detailed overview of the measures used to build each construct can be found in Table 1.

Culture was measured by four questions aiming to assess the bank's openness and receptivity towards innovation, experimentation and (reasonable) risk taking. **Organizational Structure** was measured by three questions about the existing communication, collaboration and agility in the work environment. **IT Capabilities** were measured by five questions regarding the technical resources of the bank, both in terms of specialized staff and technological infrastructure. **Customer Centricity** was measured by four questions regarding the degree to which customers' needs and satisfaction are driving (or not) business decisions. **Product Innovation** was measured by two questions evaluating the degree of innovation in the bank's products and services, mainly aimed at understanding whether they are indeed a differentiation factor *vis-à-vis* competitors. **Process Digitization** was measured by four questions assessing the degree of simplification, integration and automation of the bank's processes, as well as the extent to which the way they are defined facilitates the workflow. **Strategy & Vision** was measured by three questions encompassing employees' perception of the importance of the Digital Transformation in the company's strategy, as well as the communication of a clear digital vision, both internally and externally. The average of these 7 constructs resulted in the composed dependent variable of the study, **Digital Maturity.**

HR Practices were measured by four questions assessing the employees' perceptions towards the way human resources are managed in the bank, mainly in what respects to 1) employees having the necessary training to deal with the bank's Digital Transformation and 2) the company showing concern with the recruitment of people with high levels of digital skills. **Employees' Digital Skills** were measured by two questions about employee's digital competencies and how prepared they are to deal with the digital world, both personally and professionally. Finally, **Leadership** was measured by three questions assessing the

leaders' hard and soft skills, as well as the existence of support from higher levels within the organization towards the adoption of digital tools.

In order to evaluate the variables' internal consistency, a Reliability Analysis was performed. Cronbach's Alpha was calculated for the set of questions that compose each variable (Tavakol and Dennick 2011). According to Goforth (2015), a variable is considered very reliable if its Cronbach's Alpha is > 0.7, reliable if it is > 0.5 and unacceptable if it is < 0.5. All the variables of the model have strong levels of reliability, except for Digital Skills and Strategy & Vision, that are marginally below the 0.7 threshold. Still, as their Cronbach's Alpha is above 0.5, they can also be considered reliable. A detailed view of the reliability coefficients can be found in Table 2.

4.4. Statistical Models and Estimation Methods

4.4.1. Statistical Models

To test the abovementioned hypothesis, three models will be used to test for different things. First, Model 1 establishes the direct effect of HR Practices, Employees' Digital Skills and Leadership on Digital Maturity. This model is represented by three simple linear regressions evaluating the individual effect of each independent variable in the dependent variable (Digital Maturity).

(1.1) $Digital\ Maturity_i = \beta_0 + \beta_{HR\ Practices} + \varepsilon_i$

(1.2) $Digital\ Maturity_i = \beta_0 + \beta_{Employees'Digital\ Skills} + \varepsilon_i$

(1.3) $Digital\ Maturity_i = \beta_0 + \beta_{Leadership} + \varepsilon_i$

Model 2 focuses on the relationships between the independent variables of Model 1, trying to establish the direct effect of HR Practices on Employees' Digital Skills and on Leadership. Similarly, these relationships will be studied through two simple linear regression models.

(2.1) $Employees'Digital\ Skills_{\ i} = \beta_0 + \beta_{HR\ Practices} + \varepsilon_i$

(2.2) $Leadership_i = \beta_0 + \beta_{HR\ Practices} + \varepsilon_i$

Finally, Model 3 puts it all together and analyses the joint effect of HR Practices, Employees' Digital Skills and Leadership on Digital Maturity. In this case, a multivariate linear regression was performed.

(3.1) $Digital\ Maturity_i = \beta_0 + \beta_{HR\ Practices} + \beta_{Employees'Digital\ Skills} + \beta_{Leadership} + \varepsilon_i$

Following the rationale from Models 1 and 2, performing Model 3 allows us to understand three different things: a) the direct effect of Digital Skills and Leadership on Digital Maturity; b) the direct effect of HR Practices on Digital Maturity and c) the indirect effect of HR Practices in Digital Maturity, through the impact it has on Employees' Digital Skills and Leadership. This approach is inspired on Baron and Kenny's (1986) to test for mediation between variables.

4.4.2. Estimation Methods

As stated, Models 1 and 2 will be tested using simple linear regressions – a straightforward statistic method that allows us to study the relationship between two variables. This was the chosen method since, in these two models, the idea is to simply understand how each individual variable affects the other, without controlling for other possible relationships. All these regressions were performed using SPSS.

To estimate Model 3, however, a more complex approach was necessary. First, and given the nature of the two previous models, it was relevant to perform a multicollinearity test. This was made in order to understand if the correlation between the three explanatory variables was so high that it could jeopardize the validity of the model. For that purpose, the Variance Inflation Factor was the chosen method. Second, a specific approach was needed to calculate for (direct and) indirect effects in Model 3 and to confirm their significance. While several procedures exist, the bootstrapping method is the most widely suggested in this context (Bollen and Stinet 1990, Preacher and Hayes 2004, MacKinnon et al 2004). Bootstrapping is a re-sampling strategy with replacement used to estimate population parameters and their confidence

intervals. According to Preacher and Hayes (2004), repeatedly sampling (usually, 5000 times) makes it possible to get an empirical approximation for the indirect effect and to test for its significance through the construction of Confidence Intervals. If 0 is not between the Confidence Interval Boundaries, then the indirect effect can be considered significant. To perform this analysis, the Process Macro V3.5. was used in SPSS with a bootstrapping of 5000 samples. This tool was developed by Andrew F. Hayes.

5. Results

5.1. Preliminary Analysis

5.1.1. Respondents' Demographics

To ensure representativity (i.e., confirm that the sample was diverse), the respondents' demographics were analysed. A detailed description of this data can be found in Figure 2.

The proportion of female respondents was slightly higher than male respondents (57.2% vs 42.8%). Regarding age, the sample is well distributed, with 22.2% standing within the ages of 18-24, 20% between 25-34, 27.2% with 35-44 years old and 22.2% between 45-54. The number of respondents above 54 is slightly lower (7.2% between 54-65 and only 1.1% above 65). This is consistent with the banking reality, as this is an industry where early retirement is often (Peña and Villasalero 2010). Regarding tenure in the current bank, most answers (43.9%) state a period of less than 5 years, followed by the group that has a tenure superior to 20 years (21.7%). Quite similar results can be found regarding tenure in the industry. Finally, regarding levels of education, the majority of the respondents have a Bachelor's (43.3%) or a Master's degree (27.8%). Annual wages are also quite distributed, with the biggest bulk standing between €20k-30k (29,4%), immediately followed by the ones receiving between €10k-20k per year (28.2%). Finally, an effort was made towards representativity in what comes to the banking institutions the respondents currently work for. Nine of the biggest banks operating in Portugal (Banco BPI, Banco

Santander Totta, Novo Banco, Caixa Geral de Depósitos, Caixa Central de Crédito Agrícola, Banco Montepio, Banco CTT, BNP Paribas and Bankinter) were represented, accounting for 91% of the study.

5.1.2. Descriptive Statistics

Means, standard deviations and correlations for all variables can be found in tables 3 and 4. According to the variables considered, Digital Maturity in the banking industry stays at an average of 4.28 (on a scale from 1 to 6). However, the answers are not consensual: with a minimum of 1.52 and a maximum of 5.96, the range is quite high. This is also reflected by a Standard Deviation (SD) of 0.89. Still, as can be seen by the histogram in Figure 3, the majority of respondents attribute a value from 4 to 5 to its bank's Digital Maturity, which mirrors overall strong digital capabilities. A deeper analysis was made to understand if all the variables that form the Digital Maturity construct presented similar levels of maturity. The "weaker" variables were Process Digitization, (mean = 3.9) and IT Capabilities. Conversely, the variables with higher means are Culture (mean = 4.7, SD = 0.93) and Strategy & Vision (mean = 4.6, SD = 0.85). This suggests that the banking industry has already started to include Digital Transformation as an important part of their Strategy & Vision as well as their Culture. However, this has not yet been fully materialized in excellent IT Capabilities nor in the full integration and digitization of internal processes.

When it comes to the three "human" variables to be evaluated (HR Practices, Employees' Digital Skills and Leadership), Employees' Digital Skills was the one with a higher mean – 4.5 -, and a lower (although still high) standard deviation – 0.85. Leadership and HR Practices had means of 4.1 and 4.3, respectively. All in all, the variables representing "the human factor" of Digital Transformation seem to be aligned with the results for the Digital Maturity Variable.

5.2. Inferential Statistics and Hypothesis Testing

Model 1 measures the individual effect of HR Practices, Employees' Digital Skills and Leadership on Digital Maturity. Model 1.1. shows that HR Practices have a significant effect ($p < 0.01$) on Digital Maturity. This relationship is positive, with an unstandardized $\beta_{HR\ Practices} = 0.733$, meaning that for each unitary increase in the HR Practices "score", Digital Maturity increases by 0.733 units. Recalling that all the variables in study – including Digital Maturity – are measured on a scale from 1 to 6, this can be considered a quite strong effect. Next, Model 1.2. shows that Employees' Digital Skills are also significant ($p < 0.01$) as a predictor for Digital Maturity: with a $\beta_{Employees'\ Digital\ Skills} = 0.644$, a one unit increase in this independent variable is expected to increase Digital Maturity by 0.644 units. Finally, Leadership is also found to have a positive effect on Digital Maturity through Model 1.3: holding everything else constant, the dependent variable is expected to increase by 0.6 units when Leadership increases by one unit ($\beta_{Leadership} = 0.6$, $p < 0.01$). All in all, Models 1.1, 1.2 and 1.3. *support the underlying hypothesis H1.1, H1.2 and H.1.3, suggesting that, when considered individually, HR Practices, Employees' Digital Skills and Leadership have, indeed, a positive and relevant effect towards Digital Maturity.*

Model 2 tries to understand if HR Practices have a relevant impact on the other explanatory variables, namely Employees' Digital Skills and Leadership. Model 2.1. found a significant ($p < 0.01$) effect of HR Practices on Employees' Digital Skills, with an unstandardized $\beta_{HR\ Practices} = 0.494$, with the model predicting an increase of 0.494 units in Employees' Digital Skills if HR Practices increase by one unit. A similar but stronger conclusion can be taken regarding Leadership (Model 2.2.): with a significant ($p < 0.01$) and positive relationship, an increase of one unit in the variable HR Practices is expected to increase Leadership by 0.8 units. *These results support the underlying hypothesis H2.1 and H2.3.*

Model 3 has the purpose of concentrating all the direct and indirect effects of HR Practices, Employees' Digital Skills and Leadership towards Digital Maturity into one single Linear Regression. Multivariate Linear Regressions have, however, an underlying assumption of independence among the explanatory variables. Therefore, if the explanatory variables are too correlated, multicollinearity problems may arise, which may distort the results and affect the trustworthiness of the regression's coefficients (Kim 2019). Thus, before proceeding, it was important to analyse if these correlations were high enough to cause problems. To do so, a multicollinearity test was performed, through the analysis of the Variance Inflation Factors (VIF) – a measure that quantifies the degree of correlation between one predictor and the other predictors of the model. According to several authors (Kim 2019, Daoud 2017), a multicollinearity problem exists if VIF > 5. The analysis was performed and, as expected, HR Practices presented the higher VIF = 2.337, followed by Leadership (1.243) and Employees' Digital Skills (1.701). This means that the predictors are somehow correlated with each other, but this correlation is not enough to make the model untrustworthy. Thus, Model 3 was performed.

All in all, Model 3 presents an R^2 of 0.788, meaning that the constant and the explanatory variables (HR Practices, Employees' Digital Skills and Leadership) can explain a large proportion (78.8%) of the Digital Maturity score. The model is significant (p = .000). Following Judd & Kenny's Difference of Coefficients Approach, the indirect effect of HR Practices' on Digital Maturity can be found by computing the difference between the HR Practices' coefficient for Model 1.1. (the total effect) and the HR Practices' coefficient for Model 3 (the direct effect, when controlling for the other explanatory variables). Compared to Model 1 where $\beta_{HR\ Practices}$ = 0.733, Model 3 yielded a smaller $\beta_{HR\ Practices}$ = 0.502 (p = .000). Thus, the difference between the two (0.231) represents the total indirect effect that HR Practices have on Digital Maturity. From this total indirect effect, 0.1909 goes through Leadership and 0.0404 goes through Employees' Digital Skills. As the bootstrapping confidence intervals do not include 0, these indirect

effects are significant. *This supports the underlying hypothesis (H3), statistically confirming that HR Practices have a positive indirect effect on Digital Maturity*.

Although not relevant for the previously defined hypothesis, it became interesting to analyse if Employees' Digital Skills and Leadership are still relevant to predict Digital Maturity in this multivariate model. According to the results, and although showing a positive coefficient, Employees' Digital Skills actually lose their significance to the 95% Confidence Level (p = 0.0875). Leadership still has a significant and positive effect on Digital Maturity when controlling for the other variables, with a $\beta_{Leadership}$ = 0.239. Detailed results for all the regression models can be found on tables 5-11. All these results will be further discussed in the next section.

6. Discussion

6.1. Discussion of Results

Interesting insights can be drawn from the previous results. First, through the joint analysis of the three models, it became clear that there is, indeed, a human side in Digital Maturity: the results support that HR Practices, Employees' Digital Skills and Leadership are relevant and positively influence Digital Maturity. As seen by Model 3's R^2, the impact of these variables together is strong, which supports their importance towards the achievement of digital goals. However, when analysed individually, one understands that the three variables impact Digital Maturity differently. Thus, it becomes relevant to discuss them separately.

Among the three explanatory variables, HR Practices was the one that showed the highest impact. Results also suggest that HR Practices affect a company's Digital Maturity both directly and indirectly – by having a positive influence on Employees' Digital Skills and Leadership. The importance of HR Practices in a company as a whole is already widely study, including its major role on employees' job performance

and, by extension, on company's performance (Ostroff et al. 2000, Wright et al. 2003, Muchhal 2014). Therefore, the indirect effects were already expected and somehow supported by previous authors. However, its direct influence on Digital Maturity was not empirically studied yet. This paper closes this gap by clearly separating the direct and indirect effects and showing that, through both, HR Practices have the potential to significantly increase a company's Digital Maturity.

The fact that Employees' Digital Skills are a Digital Maturity predictor when measured individually but lose their significance when considering HR Practices in the same model is also an interesting finding. This suggests that, although Digital Skills is indeed an important variable towards the achievement of high Digital Maturity levels, it becomes redundant if HR Practices are considered at the same time. A reasonable explanation for this is that employees' skills are to a great extent driven by training and development, which is a reflection of HR Practices. If employees' digital skills are not developed within a company's training, then they were most likely previously developed and were already present when the employee was recruited. Thus, whether the employee already had those skills upon recruitment or acquired them through training, HR Practices are the main responsible for them existing inside the company. Following this rationale, one way of guaranteeing that employees have the appropriate set of digital skills is by investing on HR Practices. This joint effect is, again, expected to solidify the organization's Digital Maturity.

Finally, the previous results suggest that companies with the right leaders tend to be more Digital Mature. A part of this relationship can be explained and influenced by HR Practices (as happened with Digital Skills), but there is also a part that does not. Giving it some thought, this result is not surprising. As stated, Digital Transformation is a disruptive process, which requires major changes and constant adaptations. Consistently with several authors, change cannot be properly managed without the help of an effective leadership (Roger 2002, Caldwell et al. 2008). Therefore, the results support the idea that, if a company

wants to become Digital Mature, it must invest in leaders that not only have the right digital vision, but are also willing to commit the resources needed to achieve that vision. (Kane et al. 2017)

6.2. Implications for practice

The results of this study involve several insights that banks, and respective C-levels, must take into consideration if they want to become (or continue to be) Digital Mature organizations.

To materialize a successful Digital Transformation, a full alignment between technology and people must be achieved. None of them should be disregarded. The financial investments made by the banking industry in technology in the last few years have been significant. However, to survive in this new digital landscape, investing only in technology is not enough. At the end of the day, technology is used and managed by individuals. If those individuals are not able – or do not want – to make the best out of technology, then a successful Digital Transformation can never take place (Meske et al. 2020). That is why human factors play a huge role in Digital Maturity.

However, organizational change is nothing but easy. It threatens the status-quo and brings uncertainty to the workplace (Vakola et. al 2005). In what regards Digital Transformation, this often becomes intensified by employees fearing to have their jobs replaced by technology. As expected, this brings demotivation and resistance, which ends up undermining business results instead of adding value to them. Thus, recognizing all these challenges and investing in their mitigation needs to be considered at least as important as building strong IT Capabilities. Recruiting and training are crucial to guarantee that employees have the digital capabilities needed to transform the technological investments into actual added value inside the company. At the same time, assuring that leaders excel in both hard and soft skills is key if a bank wants to materialize its digital vision. Achieving this people-technology balance will most

likely be the differentiating factor that allows companies to build a sustainable competitive advantage and win the digital race.

This study also proposes some guidance regarding investments' prioritization. As results suggested, HR Practices are a main driver to Employees' Digital Skills, while also positively influencing Leadership. Moreover, from the three, HR Practices has shown the highest total and direct impact. Therefore, if investments need to be prioritized, HR practices should be the starting point. Still, it is important to remember that human factors usually go hand-in-hand. Thus, to guarantee consistency and drive long-term results, none of them should be disregarded.

7. Conclusions

7.1. Limitations and Suggestions for Future Research

As far as we know, Digital Transformation is a continuous and never-ending process: banks and companies around the world are constantly learning, adapting and investing accordingly. A limitation of this study is that it is static, focusing on a specific moment in time. For future research, it is recommended that different moments in time are analysed, so that the evolution of variables and their relationships across time can also be understood.

Another limitation of this study is that, when looking for indirect effects, it focuses on HR Practices (and its relationship with Employees' Digital Skills and Leadership). A similar analysis could be made with Leadership, since there is also evidence suggesting it might impact HR Practices (Vasilaki et al. 2016) and Employees' Skills (Elgelal et al. 2015). Particularly, in smaller companies, direct supervisors are generally the main responsible for employees' recruitment, training and development. Although this is not typically the case for banks, it could be interesting to analyse within a different context. Following this rationale, this study could be replicated in other industries. As stated, banking has a lot of specificities

that make these conclusions hard to generalize – even more taking into consideration that the study was conducted in Portugal, a small market. Thus, replicating it in different realities would further test its robustness.

Finally, for further research, there are other variables within the "human spectrum" that could be considered, as job satisfaction, motivation or employees' engagement, since literature is also pointing towards them being crucial to overall performance (Bin 2015). Therefore, it would be interesting to empirically evaluate if and how they impact Digital Maturity, similarly to what was done regarding HR Practices, Employees' Digital Skills and Leadership.

7.2. Final Remarks

This study reinforces that "an organization is only as good as its people" (Bhatt, 2012). Results support that there is, indeed, a human side in Digital Maturity, and its effects seem to be far too important for it to be considered only secondary. Employees – and, by consequence, organizations - can only be digital prepared if they have the right set of skills, leveraged by the right HR Practices and supported by the right leaders. This importance needs to be understood theoretically, but mostly applied in practice: technology is not enough to digital transform if employees and leaders are not on board with it. While putting them on board may not be as straightforward as one would wish, this study provides a possible starting path: companies should make sure to highly invest on HR Practices, Leadership and Employees' Digital Skill, which is likely to increase their Digital Maturity. Being more Digital Mature means not only being able to reap more benefits from digital innovations, but also being prepared to continually and constantly adapt to new realities. In a world where uncertainty is the watchword, guaranteeing this Digital Maturity is crucial to thrive.

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Tables

Table 1: Questions and Constructs

Portuguese (Original Version)

Construct	**Questions**

Culture	No meu banco existe uma cultura de abertura e receptividade em relação às tecnologias e soluções digitais no banco e entre os nossos colaboradores.
	Sinto que o meu banco promove a tomada de riscos (calculados) para promover a inovação.
	Enquanto empresa, usamos ferramentas digitais para promover a inovação, colaboração e mobilidade dos nossos colaboradores.
	De forma geral, sinto-me incentivado para experimentar e abraçar as novas soluções digitais no meu local de trabalho.
Organizational Structure	A forma como o meu banco está estruturado prioriza a comunicação e minimiza a existência de silos (isolamento de departamentos).
	O nosso modelo organizacional (a forma como o banco está estruturado) encoraja a colaboração entre departamentos.
	Considero o meu banco uma organização ágil e de rápida resposta à mudança.
IT Capabilities	Sinto que, tecnicamente, temos acesso a recursos suficientes e adequados para suportar as nossas soluções digitais.
	Temos staff especializado por trás das nossas soluções tecnológicas.
	Raramente temos falhas técnicas/de sistema devido a problemas tecnológicos.
	Tenho acesso a suporte rápido e eficiente quando preciso de qualquer tipo de apoio técnico.
	Utilizamos arquiteturas tecnológicas modernas (como a cloud) que promovem rapidez e flexibilidade nos nossos processos.
Customer Centricity	Os produtos/ofertas do banco são constantemente adaptados às necessidades do consumidor.
	A experiência do consumidor é sempre uma prioridade, mesmo que isso possa prejudicar resultados inferiores numa determinada área.
	Utilizamos métricas centradas no consumidor para medir o nosso sucesso (exemplo, nível de satisfação do cliente ou retenção).
	De forma geral, utilizamos as novas tecnologias para criar novos produtos/soluções digitais que acrescentam valor ao consumidor.
Product Innovation	Diferenciamo-nos dos nossos concorrentes através da criação de soluções digitais distintas e diferenciadoras a médio/longo prazo.
	Na minha opinião, o nosso nível de inovação contribui ativamente para a lealdade dos nossos consumidores.
Process Digitization	Todos os nossos processos – internos e externos – são/estão simplificados, unificados e perfeitamente integrados.
	Sinto que a forma como a maioria dos processos estão definidos facilita a agilidade e rapidez da tomada de decisões/ações.
	A maioria dos processos no banco estão automatizados (não necessitam de intervenção humana).
	Sinto que a digitalização dos processos e consequentes soluções digitais facilitam e/ou melhoram o meu trabalho.
Strategy & Vision	Na minha opinião, a nossa estratégia enquanto empresa depende de soluções digitais para sobreviver.
	Há uma comunicação clara da nossa visão digital internamente (para com os nossos colaboradores em qualquer posição/nível hierárquico).

	Há uma comunicação clara da nossa visão digital externamente (para com os consumidores/investidores).
HR Practices	Há investimentos suficientes em formação para adaptação às novas soluções digitais para todos os níveis hierárquicos da empresa.
	Sinto que tenho acesso a formações úteis e adequadas que melhoram/melhoraram, efetivamente, as minhas competências digitais.
	No que diz respeito a recrutamento, sinto que tem existido uma preocupação crescente por parte dos nossos recursos humanos em contratar pessoas com elevadas competências digitais.
	O meu horário de trabalho contempla um período especificamente alocado para dedicar a formação.
Employees' Digital Skills	Sou um utilizador ávido de tecnologias e soluções digitais no meu dia-a-dia.
	Os nossos colaboradores têm competências digitais suficientes para lidar com a transformação digital do banco.
Leadership	Sinto que tenho os supervisores certos para me motivarem a inovar e abraçar as soluções digitais no meu dia-a-dia
	Sinto que a nossa direção apoia ativamente a criação/utilização de soluções digitais.
	Os meus superiores (diretos e/ou indiretos) têm competências digitais suficientes para me ajudar quando necessito.

English (translation)

Construct	**Questions**
Culture	In my bank there is a culture of openness and receptivity towards digital technologies and solutions.
	I feel that my bank promotes (reasonable) risk-taking to promote innovation.
	As a company, we use digital tools to promote innovation, collaboration and mobility of our employees.
	In general, I feel encouraged to try and embrace new digital solutions in my workplace.
Organizational Structure	The way my bank is structured prioritizes communication and minimizes the existence of silos (isolation between departments).
	Our organizational model (the way the bank is structured) encourages collaboration between departments.
	I see my bank as an agile organization with the ability of quickly responding to change.
IT Capabilities	I think that we have access to enough and adequate technical resources to support our digital solutions.
	We have specialized staff creating and supporting our technological solutions.
	We rarely have technical/system failures due to technological problems.
	I have access to fast and efficient support when I need any kind of technical help.
	We use modern technological architectures (such as the cloud) that promote speed and flexibility in our activities.
	The bank's products/offers are constantly tailored to customer needs.

Customer Centricity	The consumer experience is always a priority, even if it can mean lower results in a given area.
	We use consumer-centric metrics to measure our success (e.g., level of customer satisfaction or retention).
	In general, we use new technologies to create new digital products/solutions that add value to our customers.
Product Innovation	We differentiate ourselves from our competitors in the medium/long term by creating distinct and innovative digital solutions.
	In my opinion, our level of innovation actively contributes to the loyalty of our customers.
Process Digitization	All our processes – both internal and external – are simplified, unified and seamlessly integrated.
	I feel that the way most processes are defined promotes the agility and speed of our decision-making.
	Most processes in the bank are automated (do not require human intervention).
	I feel that the digitization of processes and consequent digital solutions facilitate and/or improve my work.
Strategy & Vision	In my opinion, our strategy as a company relies on digital solutions to survive.
	There is clear communication of our digital vision internally (at any hierarchical level).
	There is clear communication of our digital vision externally (to consumers/investors).
HR Practices	In my opinion, there are enough investments in training to adapt to the new digital solutions that appear, for all hierarchical levels of the company.
	I feel that I have access to useful and appropriate training that effectively improves my digital skills.
	I feel that our Human Resources department have been increasingly concerned regarding the recruitment of people with high digital skills.
	My working hours include a period specifically allocated to training and development.
Employees' Digital Skills	I am an avid user of digital technologies and solutions in my daily life.
	Our employees have the right digital skills to handle the bank's digital transformation.
Leadership	I believe that I have the right supervisors to encourage me to innovate and embrace digital solutions in my daily work.
	I feel that our C-level actively support the creation and use of new digital solutions.
	My supervisors (direct and/or indirect) have enough digital skills to help me when I need support.

Table 2: Reliability Analysis: Cronbach's Alpha

	Number of Items	Cronbach's Alpha
Culture	4	0.851

Organizational Structure	3	0.893
IT Capabilities	5	0.885
Customer Centricity	4	0.912
Product Innovation	2	0.874
Process Digitization	4	0.789
Strategy & Vision	3	0.628
HR Practices	4	0.833
Employees' Digital Skills	2	0.59
Leadership	3	0.857

Table 3 – Descriptive Statistics

		Min	Max	Mean	Std. Deviation	Skewness	
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Digital_Maturity		1.52	5.96	4.2800	0.89471	-0.635	0.181
Culture		1.00	6.00	4.6958	0.93215	-1.038	0.181
Organizational_Structure		1.00	6.00	4.0611	1.24497	-0.491	0.181
IT_Capabilities		1.00	6.00	3.9644	1.11689	-0.282	0.181
Customer_Centricity		1.00	6.00	4.3958	1.08277	-0.723	0.181
Product_Innovation		1.00	6.00	4.3778	1.10941	-0.845	0.181
Process_Digitization		1.00	5.75	3.8875	0.89936	-0.301	0.181
Strategy_And_Vision		1.67	6.00	4.5778	0.84973	-0.680	0.181
HR_Practices		1.00	6.00	4.1458	1.04369	-0.450	0.181
Leadership		1.00	6.00	4.3278	1.15710	-0.638	0.181
Employees_Digital_Skills		1.00	6.00	4.5306	0.85084	-0.722	0.181
Valid N (listwise) = 180							

Table 4 – Correlations: Digital Maturity, HR Practices, Employees' Digital Skills and Leadership

Pearson Correlations				
	Digital_Maturity	HR Practices	Employees_Digital_ Skills	Leadership
Digital_Maturity	1	.796**	.752**	.723**
HR Practices	.796**	1	.714**	.609**
Employees_Digital_S kills	.752**	.714**	1	.644**
Leadership	.723**	.609**	.644**	1
**. Correlation is significant at the 0.01 level (2-tailed).				

Table 5 – Model 1.1: Simple Regression Model (Dependent Variable: Digital Maturity; Independent Variable: HR Practices)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.242	0.142		8.715	0.000
HR_Practices	0.733	0.033	0.855	21.989	0.000
R Square = 0.731					
Adjusted R Square = 0.729					

Table 6 – Model 1.2: Simple Regression Model (Dependent Variable: Digital Maturity; Independent Variable: Employees' Digital Skills)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.361	0.287		4.741	0.000
Employees_Digital_Skills	0.644	0.062	0.613	10.342	0.000
R Square = 0.375					
Adjusted R Square = 0.372					

Table 7 – Model 1.3: Simple Regression Model (Dependent Variable: Digital Maturity; Independent Variable: Leadership)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.683	0.164		10.281	0.000
Leadership	0.600	0.037	0.776	16.423	0.000
R Square = 0.602					
Adjusted R Square = 0.600					

Table 8 – Model 2.1: Simple Regression Model (Dependent Variable: Employees' Digital Skills; Independent Variable: HR Practices)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.483	0.208		11.949	0.000
Leadership	0.494	0.049	0.606	10.163	0.000
R Square = 0.367					
Adjusted R Square = 0.364					

Table 9 – Model 2.2: Simple Regression Model (Dependent Variable: Leadership; Independent Variable: HR Practices)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.013	0.246		4.117	0.000
Leadership	0.800	0.058	0.721	13.889	0.000
R Square = 0.520					
Adjusted R Square = 0.517					

Table 10 – Model 3: Multivariate Regression Model (Dependent Variable: Leadership; Independent Variable: HR Practices) with Multicollinearity Analysis (VIF)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
	B	Std. Error	Beta			
(Constant)	0.7964	0.1711		4.6535	0.000	
HR_Practices	0.5015	0.0455	0.585	11.0172	0.000	2.337
Employees_Digital_Skills	0.0819	0.0476	0.078	1.7186	0.0875	1.701
Leadership	0.800	0.058	0.309	13.889	0.000	2.243
R Square = 0.7876						
Adjusted R Square = 0.784						

Table 11 – Model 3: Indirect Effects of HR Practices in Digital Maturity (Process Macro V3.5 Analysis)

	Effect	SE	LLCI	ULCI
Total Indirect Effect	0.2313	0.0518	0.1276	0.3299

(through) Leadership	0.1909	0.0541	0.0853	0.2937
(through) Employees_Digital_Skills	0.0404	0.0251	0.0074	0.0908

LLCI = Lower Limit Confidence Interval

ULCI = Upper Limit Confidence Interval

Appendix

Figures

Figure 1: Conceptual Model

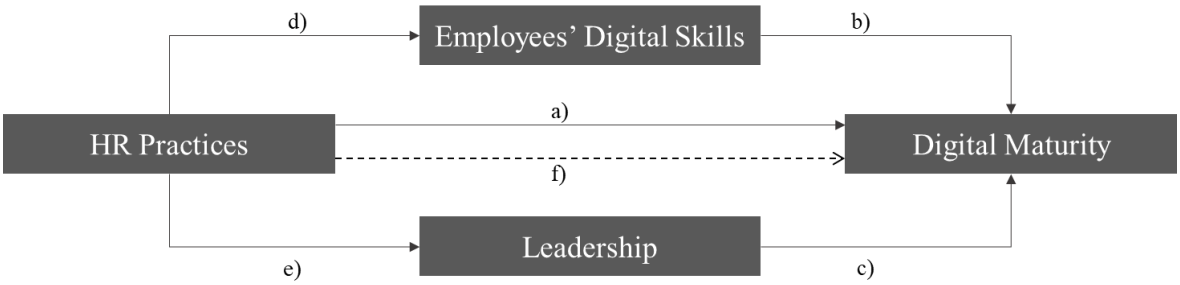
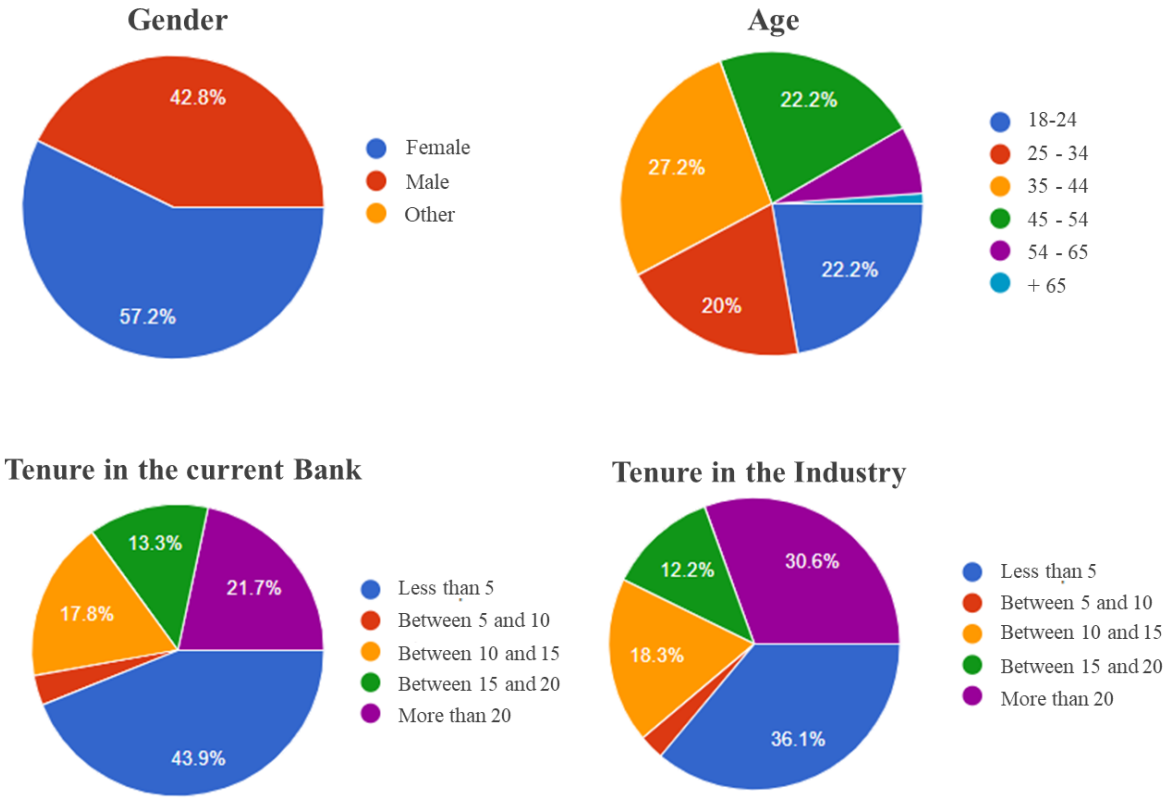


Figure 2 – Respondents' Demographics



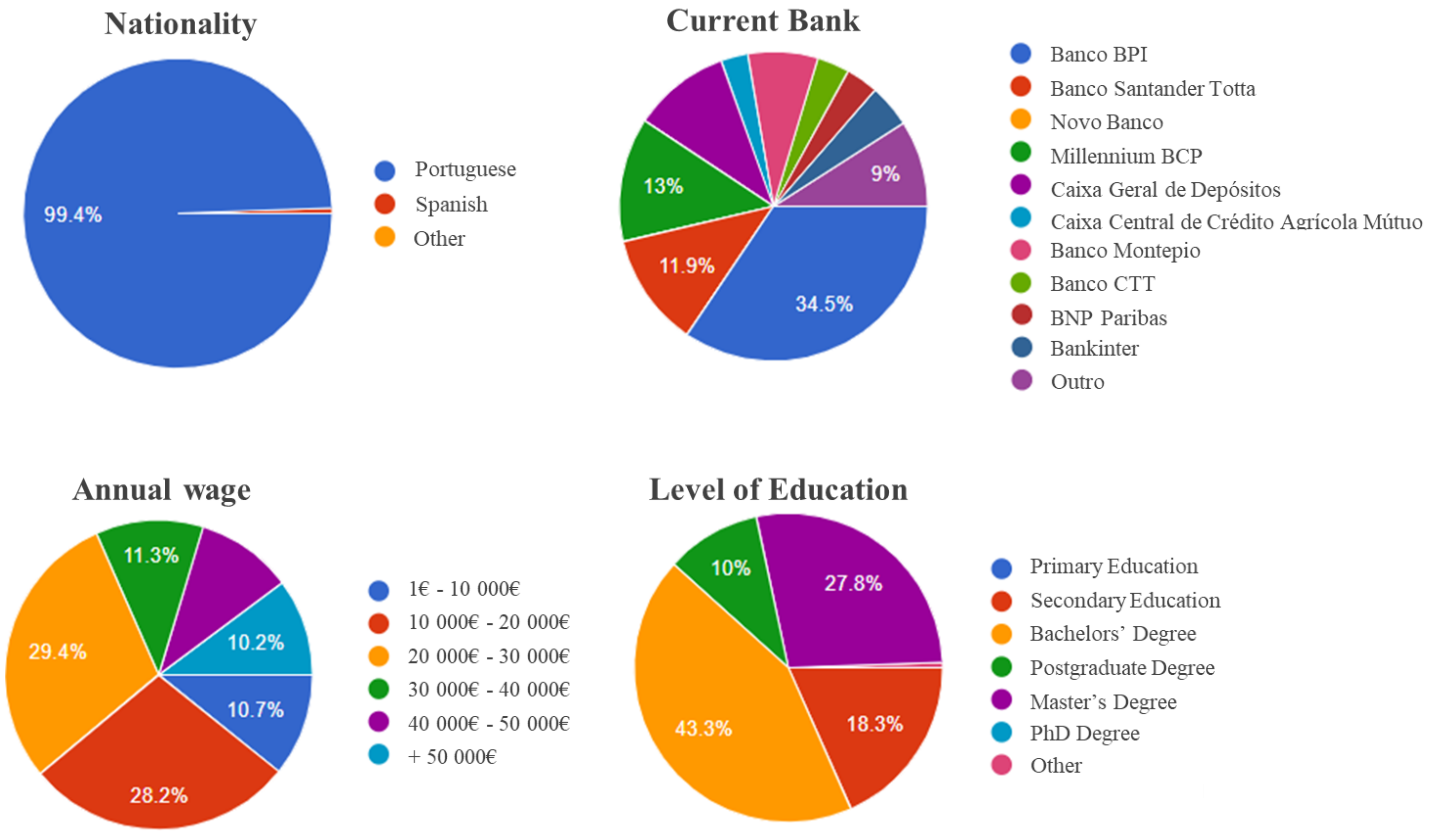
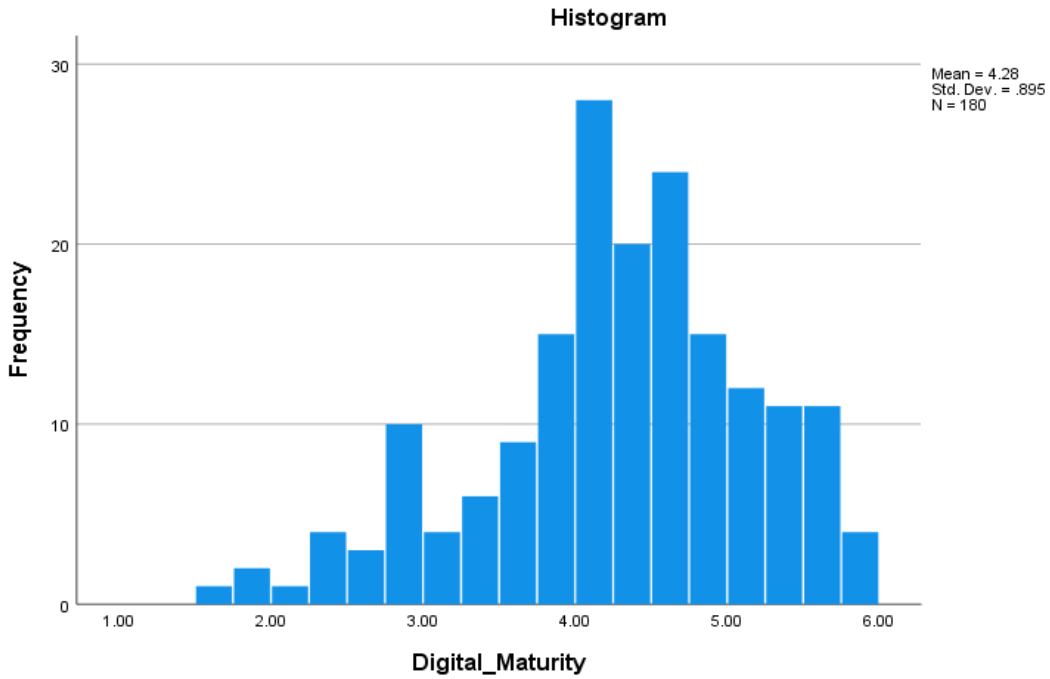


Figure 3 – Digital Maturity Histogram



Appendix

Appendix 1: Original version of the full survey (Portuguese)

Este questionário faz parte de um estudo para a minha tese de mestrado. O seu propósito é perceber o impacto do capital humano - e dos fatores que o influenciam - na maturidade digital de uma empresa, especificamente na área da Banca. A sua participação é voluntária e as suas respostas são completamente anónimas: os dados serão apresentados de forma agregada e nunca serão individualmente identificados. O preenchimento deste questionário deverá tomar-lhe apenas cerca de 5 minutos. As suas respostas deverão ser as mais honestas possíveis. Se tiver alguma questão, não hesite em contactar-me através do email 29191@novasbe.pt. Obrigada pela sua participação.
Qual o nome da instituição bancária a que pertence?
Qual é a sua idade?
Com que género se identifica?
Qual a sua nacionalidade?
Há quantos anos trabalha no setor bancário?
Há quantos anos trabalha na sua atual instituição bancária?
Qual destes intervalos melhor descreve o seu salário anual (bruto) no ano passado?
Qual o seu nível de escolaridade?
Numa escala de 1 a 6, em que 1 significa "Discordo Totalmente" e 6 significa "Concordo Totalmente", quanto concorda com estas afirmações acerca da sua experiência e instituição bancária?
No meu banco existe uma cultura de abertura e receptividade em relação às tecnologias e soluções digitais no banco e entre os nossos colaboradores.
Sinto que o meu banco promove a tomada de riscos (calculados) para promover a inovação.
Enquanto empresa, usamos ferramentas digitais para promover a inovação, colaboração e mobilidade dos nossos colaboradores.
De forma geral, sinto-me incentivado para experimentar e abraçar as novas soluções digitais no meu local de trabalho.
A forma como o meu banco está estruturado prioriza a comunicação e minimiza a existência de silos (isolamento de departamentos).
O nosso modelo organizacional (a forma como o banco está estruturado) encoraja a colaboração entre departamentos.
Considero o meu banco uma organização ágil e de rápida resposta à mudança.
Sinto que, tecnicamente, temos acesso a recursos suficientes e adequados para suportar as nossas soluções digitais.
Temos staff especializado por trás das nossas soluções tecnológicas.
Raramente temos falhas técnicas/de sistema devido a problemas tecnológicos.
Tenho acesso a suporte rápido e eficiente quando preciso de qualquer tipo de apoio técnico.
Utilizamos arquiteturas tecnológicas modernas (como a cloud) que promovem rapidez e flexibilidade nos nossos processos.

Os produtos/ofertas do banco são constantemente adaptados às necessidades do consumidor.
A experiência do consumidor é sempre uma prioridade, mesmo que isso possa prejudicar resultados inferiores numa determinada área.
Utilizamos métricas centradas no consumidor para medir o nosso sucesso (exemplo, nível de satisfação do cliente ou retenção).
De forma geral, utilizamos as novas tecnologias para criar novos produtos/soluções digitais que acrescentam valor ao consumidor.
Diferenciamo-nos dos nossos concorrentes através da criação de soluções digitais distintas e diferenciadoras a médio/longo prazo.
Na minha opinião, o nosso nível de inovação contribui ativamente para a lealdade dos nossos consumidores.
Todos os nossos processos – internos e externos – são/estão simplificados, unificados e perfeitamente integrados.
Sinto que a forma como a maioria dos processos estão definidos facilita a agilidade e rapidez da tomada de decisões/ações.
A maioria dos processos no banco estão automatizados (não necessitam de intervenção humana).
Sinto que a digitalização dos processos e consequentes soluções digitais facilitam e/ou melhoram o meu trabalho.
Na minha opinião, a nossa estratégia enquanto empresa depende de soluções digitais para sobreviver.
Há uma comunicação clara da nossa visão digital internamente (para com os nossos colaboradores em qualquer posição/nível hierárquico).
Há uma comunicação clara da nossa visão digital externamente (para com os consumidores/investidores).
Há investimentos suficientes em formação para adaptação às novas soluções digitais para todos os níveis hierárquicos da empresa.
Sinto que tenho acesso a formações úteis e adequadas que melhoram/melhoraram, efetivamente, as minhas competências digitais.
No que diz respeito a recrutamento, sinto que tem existido uma preocupação crescente por parte dos nossos recursos humanos em contratar pessoas com elevadas competências digitais.
O meu horário de trabalho contempla um período especificamente alocado para dedicar a formação.
Sou um utilizador ávido de tecnologias e soluções digitais no meu dia-a-dia.
Os nossos colaboradores têm competências digitais suficientes para lidar com a transformação digital do banco.
Sinto que tenho os supervisores certos para me motivarem a inovar e abraçar as soluções digitais no meu dia-a-dia
Sinto que a nossa direção apoia ativamente a criação/utilização de soluções digitais.
Os meus superiores (diretos e/ou indiretos) têm competências digitais suficientes para me ajudar quando necessito.

Appendix 2: Translated version of the full survey (English)

This survey is part of a study for my master's thesis. Its purpose is to understand the impact of human capital - and the factors that influence it - on a company's digital maturity, specifically in banking industry. Your participation is voluntary, and your answers are completely anonymous: the data will be aggregated when presented and your answers will never be individually identified. The survey's completion takes about 5 minutes. Your answers should be as honest as possible. If you have any questions, do not hesitate to contact me via 29191@novasbe.pt. Thank you for your participation.
What is the name of the bank you currently work for?
What is your age?
Which gender do you identify with?
What is your nationality?
What is your tenure in the banking industry?
What is your tenure in the current bank you work for?
Which of these ranges best describe your annual gross salary last year?
What is your level of education?
On a scale from 1 to 6, where 1 means "I totally disagree" and 6 means "I totally agree", how munch do you agree with the following statements, having in consideration your work experience and your current banking institution?
In my bank there is a culture of openness and receptivity towards digital technologies and solutions.
I feel that my bank promotes (reasonable) risk-taking to promote innovation.
As a company, we use digital tools to promote innovation, collaboration and mobility of our employees.
In general, I feel encouraged to try and embrace new digital solutions in my workplace.
The way my bank is structured prioritizes communication and minimizes the existence of silos (isolation between departments).
Our organizational model (the way the bank is structured) encourages collaboration between departments.
I see my bank as an agile organization with the ability of quickly responding to change.
I think that we have access to enough and adequate technical resources to support our digital solutions.
We have specialized staff creating and supporting our technological solutions.
We rarely have technical/system failures due to technological problems.
I have access to fast and efficient support when I need any kind of technical help.
We use modern technological architectures (such as the cloud) that promote speed and flexibility in our activities.
The bank's products/offers are constantly tailored to customer needs.
The consumer experience is always a priority, even if it can mean lower results in a given area.
We use consumer-centric metrics to measure our success (e.g., level of customer satisfaction or retention).
In general, we use new technologies to create new digital products/solutions that add value to our customers.
We differentiate ourselves from our competitors in the medium/long term by creating distinct and innovative digital solutions.
In my opinion, our level of innovation actively contributes to the loyalty of our customers.

All our processes – both internal and external – are simplified, unified and seamlessly integrated.
I feel that the way most processes are defined promotes the agility and speed of our decision-making.
Most processes in the bank are automated (do not require human intervention).
I feel that the digitization of processes and consequent digital solutions facilitate and/or improve my work.
In my opinion, our strategy as a company relies on digital solutions to survive.
There is clear communication of our digital vision internally (at any hierarchical level).
There is clear communication of our digital vision externally (to consumers/investors).
In my opinion, there are enough investments in training to adapt to the new digital solutions that appear, for all hierarchical levels of the company.
I feel that I have access to useful and appropriate training that effectively improves my digital skills.
I feel that our Human Resources department have been increasingly concerned regarding the recruitment of people with high digital skills.
My working hours include a period specifically allocated to training and development.
I am an avid user of digital technologies and solutions in my daily life.
Our employees have the right digital skills to handle the bank's digital transformation.
I believe that I have the right supervisors to encourage me to innovate and embrace digital solutions in my daily work.
I feel that our C-level actively support the creation and use of new digital solutions.
My supervisors (direct and/or indirect) have enough digital skills to help me when I need support.